

AMENDMENT TO THE DRAWINGS

The attached replacement sheet of drawings includes changes to Figure 1. This sheet, which includes Figures 1 and 2, replaces the original the sheet including Figures 1 and 2. In Figure 1, storage units P, Q and R are now labeled as “Check Storage Units.”

Appendix Attachment: Replacement Sheet for Figures 1 and 2

REMARKS

The Office Action dated June 2, 2006, and the patents and publications cited therein have been carefully reviewed, and in view of the above changes and following remarks reconsideration and allowance of all the claims pending in the application are respectfully requested.

The Drawings

The drawings stand objected to because storage units P, Q and R should be labeled as “check storage units.”

Applicants have attached herein a replacement sheet of drawings includes changes to Figure 1. This sheet, which includes Figures 1 and 2, replaces the original the sheet including Figures 1 and 2. In Figure 1, storage units P, Q and R are now labeled as “Check Storage Units.”

Consequently, Applicants respectfully request that the Examiner withdraw this rejection.

The Amendments To The Claims

Applicants have amended claims 3-6, 10 and 12 to improve their respective forms in accordance with U.S. patent law. The amendments to claims 3-6 are not in response to prior art and, in fact, because the amendments to claims 3-6 broaden the respective scopes of claims 3-6, it is respectfully asserted that no prosecution-history estoppel results from the amendment.

The amendments of claims 10 and 12 are directed to formal matters and do not narrow the scope of either of claims 10 or 12. Therefore, no prosecution-history estoppel results from the amendment.

The Rejection Under 35 U.S.C. § 112, Second Paragraph

Claims 1 and 10-12 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention.

Regarding claim 1, Applicants respectfully traverse this rejection. In that regard, Applicants respectfully submit that the invention of claim 1 is not limited to the situation in

which the array controller is couple to the three storage units and three check units in parallel, as suggested by the Examiner. Accordingly, Applicants respectfully submit that the present invention can be embodied by a system of storage units that may, from a relatively high-level appear, to the array controller to be coupled in series through one or more storage units.

Regarding claim 10, Applicants respectfully traverse the rejection of claim 10. In particular, Applicants respectfully submit that claim 10 relates to “failure of any three data storage units and check storage units” before data stored on the data storage subsystem is lost. That is, claim 10 relates to a predetermined number of failures of storage units before stored data is lost from the system. Applicants respectfully submit that the Examiner’s statement appears to be blurring the concept of storage unit failures and data loss. As such, Applicant’s respectfully submit that claim 10 is already clear and should be valued on the merits.

Regarding claim 11, Applicants respectfully traverse the rejection of claim 11. Applicants respectfully submit that claim 11 is directed to subject matter of claim 1, wherein data is recoverable from a partially readable storage unit. Applicants respectfully submit that the subject matter of claim 11 is fully consistent with the subject matter of claim 1. Moreover, the Examiner’s assertion that “[d]ata has to be recovered from a partially readable storage unit” is not necessarily true. Further, the Examiner’s assertion that “[i]t cannot be recovered if the data is completely lost” is also not necessarily true. For example, the subject matter of claim 1 provides that the contents of the check storage units are determined so that any three erasures of the data storage units and the check storage units can be corrected. Thus, in the case that the data on any one storage or check unit is lost, the data can be recovered and is not “completely lost,” as asserted by the Examiner. As such, Applicant’s respectfully submit that claim 11 is already clear and should be valued on the merits.

Regarding claim 12, Applicants have amended claim 12 to improve its form, as described above.

Consequently, Applicants respectfully request that the Examiner withdraw this rejection.

The Rejection Under 35 U.S.C. § 103(a) Over King

Claims 1-6 and 12 stand rejected under 35 U.S.C. § 103(a) as unpatentable over King et al. (King), U.S. Patent No. 6,530,004. This rejection is respectfully traversed.

Applicants respectfully submit that the present invention according to any of claims 1-6 and 12 is patentable over King. Applicants respectfully submit that King is not properly modifiable to form a basis for rejection of these claims.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. In that regard, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Applicants respectfully submit that the Examiner's assertion that "it would have been obvious "to limit the number of storage units and number of corresponding check units in King to three" misses the point of the claimed invention of claims 1-6 and 12. For example, claim 1 is directed to a data storage subsystem, comprising three data storage units, three check storage units, and an array controller coupled to the three data storage units and the three check storage units, such that the array controller determines the contents of the check storage units so that any three erasures of the data storage units and the check storage units can be corrected by the array controller. A review of King indicates that King does not disclose or suggest such a concept.

To illustrate this point, consider Table 1 on page 7 of the present patent application. Table 1 indicates that a RAID 5 configuration and a RAID 6 configuration respectively have a Hamming distance of 2 and 3. In contrast, the present invention, which is referred to as a RAID 3 + 3 array in the present patent application, has a Hamming distance of 4. Now consider the disclosure of King. King, in particular, only discloses RAID 0, RAID 1, RAID 5 and RAID 6 configurations. Accordingly, none of the RAID configuration disclosed by King has a Hamming distance that is greater than 3. Thus, none of the RAID configurations disclosed by

King can have any three erasures of data storage units and check storage units that can be corrected.

Further regarding the Examiner's proffered motivation to modify King, Applicants respectfully submit that the Examiner has provided no support for the mere assertion of "having three corresponding check disks would be efficient for the array controller to correct any erasures in the storage unit with the corresponding three check units."

Thus, claim 1 is allowable over King. It follows that claims 2-6 and 12, which each incorporate the limitations of claim 1, are each allowable for at least the same reasons that claim 1 is considered allowable.

Further regarding claims 2-6, Applicants respectfully traverse the Examiner's assertion that "King substantially teaches ... RAID 3 + 3 system" [sic]. In this regard, Applicants respectfully submit that the Examiner has not pointed out with specificity where King "substantially teaches" a RAID 3 + 3 system.

Regarding claim 2, Applicants respectfully submit that claim 2 is allowable over King for the additional reason that King does not disclose or suggest that information is stored on the data storage subsystem as a symmetric Maximum Distance Separation code. Applicants respectfully submit that the Examiner's should provide specificity as to the basis for King substantially teach a RAID 3 + 3 system, in addition to a proper nexus for the assertion regarding "some type of code such as symmetric Maximum Distance Code, ..." with respect to claim 2. Further, Applicants respectfully traverse the Examiner's assertion that "it is well known in the art for data to stored [sic] in RAID to use some type of code such as symmetric Maximum Distance Code, a Winograd code, a Reed-Solomon code or an evenodd code ..." and respectfully request that the Examiner provide support for such an assertion.

Regarding claim 3, Applicants respectfully submit that claim 3 is allowable over King for at least the same reasons that claim 2 is considered allowable and with the additional reason that King does not disclose or suggest that the Maximum Distance Separation code comprises a Winograd code. Further, Applicants respectfully submit that the Examiner's should provide specificity as to the basis for King substantially teach a RAID 3 + 3 system and a proper

nexus for the assertion regarding “some type of code such as ..., a Winograd code, ...” with respect to claim 3.

Regarding claim 4, Applicants respectfully submit that claim 4 is allowable over King for at least the same reasons that claim 2 is considered allowable and with the additional reason that King does not disclose or suggest that the Maximum Distance Separation code comprises a Reed-Solomon code. Additionally, Applicants respectfully submit that the Examiner’s should provide specificity as to the basis for King substantially teach a RAID 3 + 3 system and a proper nexus for the assertion regarding “some type of code such as ..., a Reed-Solomon code, ...” with respect to claim 4

Regarding claim 5, Applicants respectfully submit that claim 5 is allowable over King for at least the same reasons that claim 2 is considered allowable and with the additional reason that King does not disclose or suggest that the Maximum Distance Separation code comprises an EVENODD code. Applicants respectfully submit that the Examiner’s should provide specificity as to the basis for King substantially teach a RAID 3 + 3 system and a proper nexus for the assertion regarding “some type of code such as ..., an evenodd code, ...” with respect to claim 5

Regarding claim 6, Applicants respectfully submit that claim 6 is allowable over King for at least the same reasons that claim 2 is considered allowable and with the additional reason that King does not disclose or suggest that the Maximum Distance Separation code comprises a derivative of an EVENODD code. Applicants respectfully submit that the Examiner’s should provide specificity as to the basis for King substantially teach a RAID 3 + 3 system and a proper nexus for the assertion regarding “some type of code such as ...,” a derivative of an EVENODD code” with respect to claim 6

Thus, Applicants respectfully submit that it is only by impermissible hindsight that the Examiner is able to reject claims 1-6 and 12 based on the proffered modification. King does not provide a proper suggestion for such a modification. It is only by the Applicants’ disclosure that the Examiner can attempt to select particular modification of King to make the rejection.

Consequently, Applicants respectfully request that the Examiner withdraw this rejection and allow claims 1-6 and 12.

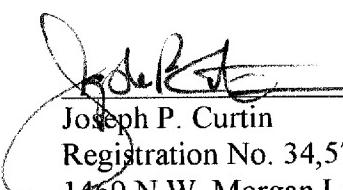
CONCLUSION

In view of the above amendments and arguments, it is urged that the present application is now in condition for allowance. Should the Examiner find that a telephonic or personal interview would expedite passage to issue of the present application, the Examiner is encouraged to contact the undersigned attorney at the telephone number indicated below.

It is requested that this application be passed to issue with claims 1-12

Respectfully submitted,

Date: September 10, 2006


Joseph P. Curtin
Registration No. 34,571
1469 N.W. Morgan Lane
Portland, Oregon 97229-5291
(503) 296-8373
(503) 297-0452 (facsimile)